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REPORT OF PINE BEETLE SURVEYS

on the

FREMONT NATIONAL FOREST AND ADJACENT TIMBERLANDS

Seasons of 1947 and 1948

By

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Portland 5, Oregon
May 23, 1949

SUBJECT—

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INTRODUCTION

Since 1921, intensive surveys designed: (1) to follow the trend of pine beetle losses in commercially valuable ponderosa pine stands, (2) to determine the need for control measures, and (3) to acquaint local forest administrators with their insect problems have been conducted cooperatively on the Fremont National Forest and adjacent timberlands on an annual basis. These surveys have been joint projects between the Forest Service, the Weyerhaeuser Timber Company and the Bureau of Entomology and Plant Quarantine. Administrative reports, summarizing the results of these surveys, have usually followed each survey. The last report* recorded the surveys during the seasons of 1944-1946.

It is the purpose of this report to cover the results of surveys on virgin check plots during the seasons of 1947 and 1948 and to report the partial losses for 1948. The total mortality for 1948 will not be available until another survey has been made during the summer of 1949.

Without the splendid cooperation and assistance, in the form of both funds and personnel on the part of the Forest Service and the Weyerhaeuser Timber Company, these surveys would have been impossible. This assistance is gratefully acknowledged.

* Forest insect surveys on the Fremont National Forest, Oregon and adjacent private lands, seasons of 1944, 1945, and 1946. By F. P. Keen, February 26, 1947.

SURVEY METHODS

Information on insect-caused ponderosa pine mortality on the Fremont National Forest and the adjacent timberlands has been obtained from two main sources: (1) One hundred percent cruises have been made on representative 320 and 640-acre check plots scattered at random in the virgin stands, and (2) general reconnaissance or observational surveys have been made at various times over most of the forested area to correlate the plot data with the mortality on the forest as a whole.

In 1947 and 1948, thirteen 320-acre and two 640-acre check plots (Table 2) were cruised by the survey crews. These plots were in virgin stands. Unfortunately, no data have been collected on insect-caused losses in the reserve stands on cutover areas, except those taken in connection with the sanitation-salvage cuttings of the Weyerhaeuser Timber Company in the Bly Area and the special methods of cutting study plots recently established on the forest by the Berkeley Forest Insect Laboratory.

The last reconnaissance survey of the forest as a whole was made in 1943. In going to and from the check plots, however, the general status of insect-caused losses has been under general observation. The District Rangers and timber sales personnel of the Fremont National Forest as well as the forestry staff of the Weyerhaeuser Timber Company are well aware of the seriousness of insect mortality and have informed this Bureau of some of their problems.

Survey Personnel

The personnel of the survey crews during 1947 and 1948 are shown in Table 1.

In 1947 the check plot surveys were made under the direction of J. W. Bongberg of the Berkeley Forest Insect Laboratory by a three-man crew from the Forest Supervisor's office. This arrangement was necessary because the appointments of the temporary assistants, employed through the Office of Timber Management and making the surveys on the other plots in the region, had been terminated. Supervision of the surveys on this forest had been under the direction of the Berkeley Station since 1941.

The 1948 survey on all but three virgin plots was made by a three-man crew employed through the Office of Personnel Management (R-6) whose salaries, expenses, and charges for transportation and equipment were covered by a regional insect survey fund of \$8000 set up by the Office of Timber Management. This crew was under the direction of the writer. The Berkeley Laboratory again made the surveys on the sanitation-salvage cutting areas as well as on three virgin plots in the Bly, Bonanza, and Sycan Marsh areas.

RESULTS OF THE SURVEYS

The ponderosa pine mortality found on the check plots in 1946 and 1947 is included here as a matter of record and to complete the long-time trend on this forest. It is the recent losses of 1948 that are of most interest.

Primary Insects

As in past surveys, practically all of the ponderosa pine mortality on the Fremont National Forest was caused by the western pine beetle (Dendroctonus brevicomis Lec.). Attacks by the mountain pine beetle (D. monticolae Hopk.), the California melanophila (Melanophila californica VD), the emarginate ips (Ips emarginatus Lec.), and the Oregon pine engraver (I. oregoni Eichh.) either separately or in combination with the western pine beetle accounted for the remainder of the mortality found on these surveys. In any one year or over several years, the percentage of the total losses caused by these latter insects is small and of little consequence.

Recent Check Plot Losses

The check plot losses for 1946 and 1947 are presented by individual plots in Table 2. As shown in this table, there was a considerable variation in the mortality on the plots in both years. The percentage of stand killed in 1946 varied from 0 to .99 percent and in 1947 it varied from .22 to 1.95 percent. On three plots the losses in 1947 were lower than those of 1946 while on 12 plots the trend turned noticeably upward in 1947. Mortalities higher than the rate of annual growth were found on 11 of 15 check plots during 1947. The highest and lowest mortalities were again found in the Silver Lake and Warner Mt. areas respectively. The McCall plot in the Sycan Marsh area showed the sharpest rise in 1947, jumping from 47 board feet per acre in 1946 to 140 board feet per acre in 1947.

In the last survey report for this forest, it was estimated that the average 1946 losses on the check plots of the Silver Lake area would reach a new high level of 123 board feet per acre. As pointed out in this report, this estimate was based on surveys made in August when less than 50 percent of the total mortality was evident. When the 1946 records for these plots were completed it was found that the average losses were only 95 board feet per acre so that the depletion of these stands in 1946 was not as severe as anticipated.

Current Check Plot Losses

At the time of the 1948 surveys, approximately 40 percent of the probable losses for the year were marked by the crews. By using an estimating factor for the percent of total annual loss spotted on any date, an indication of the probable trend in 1948 losses was obtained (Table 3.). However, as pointed out above, this prediction may not be too accurate but it is the best available means of obtaining trend data with partially completed survey records.

Compared with the 1947 mortality on the same check plots, the 1948 losses on the Sycan Marsh area will probably be at the same level of 89 board feet per acre. On the other areas of this forest it is estimated that the 1948 losses will be lower than those of 1947. Reductions of from 14 percent on the Chewaucan area to 63 percent on the low hazard stands of the Warner Mt. area are predicted. On the Silver Lake and Sycan Marsh areas, current losses remain higher than the annual growth rate, while on the Chewaucan, Dog Lake and Bonanza areas mortality and growth balance. Gross losses on the Bly, and Warner Mt. areas are decidedly less than present growth.

CONCLUSIONS

Pine beetle losses in the virgin ponderosa pine stands on and adjacent to the Fremont National Forest reached a fairly high level in both 1946 and 1947. This was in sharp contrast to the mortality of 1942 when the lowest losses since 1921 were recorded. Direct control measures were deemed unnecessary during either of these years because high epidemic losses were not evident.

The institution of sanitation-salvage logging, aimed at removing the high risk elements in the stands ahead of regular operations, is again recommended for the Silver Lake and Sycan Marsh areas. This recommendation has been made in previous survey reports because of the excessive amount of timber susceptible to pine beetle attack and the continued high level of bark beetle mortality in these areas.

Pine beetle losses are at a low ebb in the Dog Lake, Bly and Warner Mt. areas. The latter area has continually shown very low losses and yet cutting operations are continuing. The Crane Mt. check plot in this area has been cruised for the last time because it was marked for cutting in 1948. If possible, these operations should be curtailed in the areas showing a high net volume and shifted to those stands where noticeable depletion is occurring annually.

Table I. Personnel Conducting Pine Beetle Surveys on the Fremont National Forest in 1947 and 1948

<u>Year</u>	<u>Area</u>	<u>Personnel</u>
1947	Entire Forest	J. W. Bongberg, Bu. Ent. & P. Q. G. Martin, Forest Service A. Maloney, " " B. Elmgren, " "
1948	Virgin Plots	J. Hunt (Crew Leader), Forest Service A. P. Detlefsen, " " H. J. Gratkowski, " "
	Sanitation-Salvage Cuttings	J. W. Bongberg, Bu. Ent. & P. Q. 2 Assistants from Weyerhaeuser Timber Company

Table 2. Pine Timber Killed by Pine Beetles on Virgin Check Plots, Fremont National Forest and Adjacent Private Lands

Area & Unit	Check Plot	Timbered Pine Vol. Year			No. of Trees	Volume B.M.	Trees Per Section	B.M. Per Acre	% of Stand
		Acres	1941	MMB					
SILVER LAKE Embody	Antelope Spring	320	4,100	1946	34	40,520	68	127	.99
	T28S, R12E, Sec.2N/2			1947	28	28,580	56	89	.70
	Rock Butte	320	5,620	1946	46	54,020	92	169	.96
	T28S, R12E, Sec.18S/2			1947	34	29,670	68	93	.53
Silver Ck.	Rodman Peak	320	4,850	1946	11	9,780	22	31	.20
	T29S, R12E, Sec.25S/2			1947	27	18,070	54	56	.36
	Thomson Res.	270	2,100	1946	21	12,820	42	40	.61
	T30S, R13E, Sec.13N/2			1947	56	37,270	102	116	1.95
SYCAN MARSH Hager	Sherlock	320	4,720	1946	13	24,970	26	78	.53
	T30S, R15E, Sec.21N/2			1947	19	26,870	38	84	.57
	McCall	320	*	1946	14	15,160	28	47	*
	T30S, R14E, Sec.12W/2			1947	59	44,890	118	140	*
Currier	Currier Camp	320	5,850	1946	12	18,720	24	58	.32
	T32S, R15E, Sec.22W/2			1947	31	43,590	62	136	.75
Merritt Ck.	Shake Butte	620	11,619	1946	20	21,980	20	36	.19
	T33S, R14E, Sec.34			1947	32	26,140	32	42	.22
BLY	Mitten Spring	320	*	1946	12	14,250	24	44	*
	T36S, R16E, Sec.32N/2			1947	12	17,960	24	56	*
BONANZA Goodlow	Goodlow	600	7,973	1946	71	44,610	71	74	.56
	T39S, R13E, Sec.5			1947	67	40,450	67	67	.50
CHEWAUCAN Thomas Ck.	Thomas Creek	320	4,750	1946	9	15,610	18	49	.33
	T37S, R19E, Sec. 30W/2			1947	9	16,170	18	51	.34
	Chewaucan	320	3,450	1946	13	19,890	26	62	.58
	T35S, R18E, Sec.19E/2			1947	28	30,690	56	96	.89
Coleman	South Flat	320	4,000	1946	7	15,450	14	48	.39
	T36S, R18E, Sec. 32S/2			1947	20	16,740	40	52	.42
DOG LAKE Dog Lake	Dog Lake	320	3,400	1946	5	8,670	10	27	.25
	T40S, R17E, Sec.19W/2			1947	22	19,900	44	62	.58
WARNER MOUNTAIN	Crane Mt.	320	4,100	1946	0	0	0	0	0
	Crane Mt. T40S, R21E, Sec.11S/2			1947	6	13,760	12	43	.34

* No data available.

Table 3. Estimated Trend in Pine Beetle Losses Between 1947 and 1948
on Virgin Check Plots

Acre	Acres Cruised	Average Bd. Ft. Per Acre-1947	Estimated Average Bd. Ft. Per Acre 1948	Probable Trend 1948/1947
Sycan Marsh	1580	89	89	100%
Silver Lake	1230	97	77	79%
Chewaucan	960	66	57	86%
Bonanza	600	67	57	86%
Deg Lake	380	62	50	80%
Bly	380	24	15	62%
Warner Mt.	380	45	16	37%